FY2012

VCNP Annual FY Visitor Summary Report

Dr. Tim Haarmann
Director, Operations Division
Valles Caldera National Preserve
11/15/2012

2012 Annual Visitor Summary Report

Valles Caldera National Preserve

Executive Summary

During 2012, the Valles Caldera Trust continued with the implementation of a rigorous visitor counting system originally developed in 2011. This counting program was implemented in an attempt to be consistent with other public land agencies and their visitor counting techniques. Using advanced counters at 6 locations, and having worked in consultation with a National Park Service statistician to develop the counting program, the number of visitors at the VCNP during FY2012 is reasonably estimated to be 110,785. This is up from last year's visitors (97,552).

Introduction

The Valles Caldera Trust was created by the Valles Caldera Preservation Act of 2000 to preserve and protect the historic Baca Ranch of New Mexico's Jemez Mountains. The groundbreaking legislation that provided for the federal purchase of this 89,000-acre ranch nestled inside a volcanic caldera also created a unique experiment in public land management.

Keeping track of visitor numbers is a critical tool in both planning and managing a public resource such as the VCNP. Prior to 2011, visitor totals on the Preserve were calculated by counting actual visitors who participate in an activity or who signed in at one of our two staging areas. However, it was determined that the Trust might be undercounting visitors, hence staff moved forward in developing and implementing a more rigorous and defensible counting system. The goal was to have a program that was more in line with other public land agencies. Bringing the visitor counting system

on par with other public land management agencies will assure a reasonable comparison of visitor counts with other public lands and ultimately allow a better analysis of visitation patterns. In 2012, we continued with the counting program developed in 2011.

Materials and Methods

Trust staff used advanced counters manufactured by TRAFx Research Ltd. A TRAFx system. These counters consist of state-of-the-art hardware and software to collect, retrieve, analyze, manage, store and share data. The Trust owns two types of counters: vehicle counters and infrared trail counters. These were employed starting in Oct 1st 2011 (the beginning of FY12)

TRAFx products are used by government agencies and research institutions in the US, Canada, Australia and Europe for parks and public lands management, recreation studies, traffic and transportation studies, and visitor studies.

There were several features of the TRAFx devices that make them suitable for use on the Preserve:

- Advanced Microelectronic Design
- Install at Roadside, Above or Below Ground
- High-Quality Infrared Scope on trail counter
- Self-Contained Design, no External Wires or Tubes
- Ideal for Rural, Rugged and Remote Roads
- Use as Permanent or Portable Counter
- Very Small and Easy to Hide — Reduces Vandalism Risk
- Low Operating, Maintenance, and Installation Costs
- Long Battery Life (approx. 1 year)
- Large Memory Capacity (store > 400 million counts)
- Field-Proven, Generation III Design (10 year history)

Vehicle Counter: This reliable and compact vehicle counter (Figure 1) uses a tiny magnetometer and advanced embedded software to detect passing vehicles. Passenger cars can be counted from up to 20 feet away, allowing coverage of two lanes from a roadside installation. Furthermore, the counter's detection range is user-programmable, and can be adjusted for single lane or two lane counting.

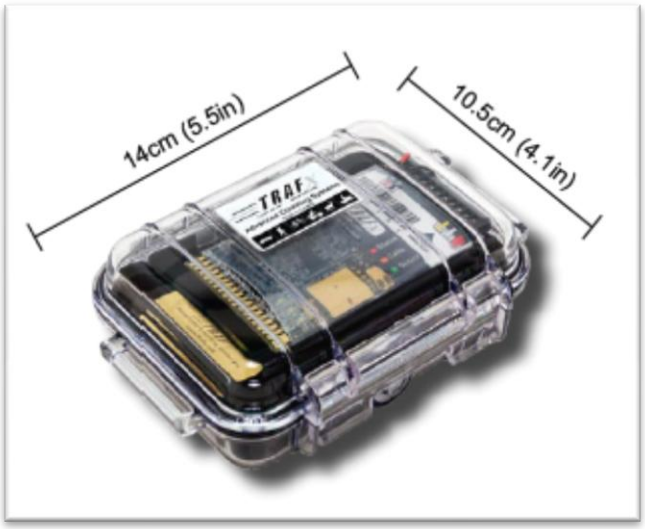

Figure 1. TRAFx Vehicle Counter

Specifications of the traffic counter include:

CASE: 14cm x 10.5cm x 5cm (5.5in x 4.1in x 2in); weatherproof
WEIGHT: 250g (8.8oz) (without batteries)
POWER: "C size" batteries; alkaline (e.g., Duracell) or lithium
BATTERY LIFE: 12 to 14 months max. with three alkalines 36 months max. with one lithium
DETECTION RANGE: 6m (20ft) max. for most passenger vehicles
DATA TYPE: ASCII; .TXT fi le type
DIGITAL MEMORY DESIGN: Data and settings are retained even when batteries are replaced or die
TIME KEEPING: Quartz clock; 20ppm accuracy
OPERATING TEMPERATURE: -40C (-40F) to +70C (158F)
SENSOR TYPE: Low-fi eld geomagnetic; 14-bit resolution
COMMUNICATIONS: RS232 serial; 115,000 baud
OTHER: Gold-plated PCB; silicon conformal protected electronics; electrostatic discharge protection; short circuit protection; RoHS (leadfree)

Trail Counter: The TRAFx Infrared Trail Counter (Figure 2) is designed to count general traffic on trails and paths. Unlike most infrared trail counters, it does not require a receiving unit or reflector to operate. This results in a very compact, easy-to-hide design, which reduces risk of vandalism. Using a small, high-quality infrared scope mounted on a tree and pointed towards the trail, the Trail Counter detects and counts the infrared signature associated with warm, moving objects.

Figure 2. TRAFx infrared Trail Counter

Specifications of the trail counter include:

CASE: 11cm x 7cm x 3cm (4.3in x 2.8in x 1.2in); weatherproof
TOTAL WEIGHT: 170g (6oz) (without batteries)
CABLE: 1m (3.3ft)
POWER: Three "AA size" alkaline batteries (e.g., Duracells)
BATTERY LIFE: Approx. 3 years
DIGITAL MEMORY DESIGN: Data and settings are retained even when batteries are removed
TIME KEEPING: Quartz clock; 20ppm accuracy
OPERATING TEMPERATURE: -40C (-40F) to +50C (122F)
SENSOR TYPE: Thermal infrared microsensor
DETECTION RANGE: 6m (20ft)
COMMUNICATIONS: RS232 serial; 115,000 baud
DATA TYPE: ASCII; .TXT fi le type
OTHER: Gold-plated PCB; silicon conformal protected electronics;

Consultation with National Park Service: During the original 2011 study, Trust staff consulted with National Park Service statistician Mr. Butch Street. Mr. Street works for the Public Use Statistics Office, which is located in the Social Science Division under the Office of the Associate Director for Natural Resource Stewardship and Science. The Public Use Statistics Office manages a program for collecting, auditing, and analyzing visitation data that are provided by individual National Park System units on a monthly basis. Mr. Street was most helpful in helping design a VCNP specific counting program, providing tips on eliminating counting errors and misinterpretations. During 2012, we replicated all aspects of the 2011 program.

Implementation of Counting Program: The VCNP visitor counting program was implemented based on a set of key points. These included:

1. Calibration of counters to their location is critical. We will follow NPS recommendations for random surveys both am and pm for one hour during the sampling period to determine accuracy of counters.
2. Calibration should occur at different times of the day/year to determine the effects of different traffic patterns on counting accuracy. All counters will be calibrated to insure no one is double counted, establish an error factor, develop a person per vehicle multiplier, and determine non-reportable percentages (Appendix A).
3. Counter accuracy is affected by both how the counter is installed, and how traffic behaves at the installed location. We will pay close attention to installation.
4. Once snow conditions allow, G3 magnetic vehicle counter will be placed at 8 locations: Highway 4 east, Highway 4 west, Highway 4 east pullout, Highway 4 west pullout, Valles Caldera main gate, Banco Bonito gate, Redondo gate, and Sulphur gate. These will be kept in place until season patterns become apparent and our counters can be done on a more seasonal basis.

5. Side-oriented infrared counters will be placed at Coyote Call and Valles Caldera trail entrances since these are best suited in narrow locations where people cannot walk side-by-side.
6. Active infrared sensors can be sensitive to environmental factors (heavy rain or snow, mist, waving branches in front of the beam, etc.), so will be placed accordingly.
7. Counters should be placed at locations that are representative of visitor behaviors, based on VCNP staff knowledge of the area.
8. Installations should be discrete. Vandalism of counters can be expensive and time consuming.
9. Staff should be adequately trained and have a vested interest in counting program success. This generally leads to more reliable and accurate results.
10. Data will be collected before batteries are low and as often as is reasonable based on staffing availability

Results

Raw data were downloaded from the counters on an intermittent basis throughout the year. While there were occasional issues with the counters (batteries, temperature and moisture) the counters collected ample data to give a reasonable estimate of the number of visitors. While we had 10 counters deployed, again this year, we opted to use information from only 6 counters in our final estimates of visitors. The other 4 (highway 4 traffic and highway 4 pullouts) will be used for planning purposes and not in our total estimates of visitors.

The raw data were analyzed using the following methodology and assumptions:

- The total numbers on each counter at a gate data were divided in half to avoid double counting (everyone comes and goes through a gate).
- Person per Vehicle Multiplier = 2.0 based on 12 surveys, which was applied to each individual vehicle count.
- Pull-out and highway data were not used in total visitor count estimates.
- An adjustment factor of 0.924 was used on the main gate visitor counts to eliminate double counting based on findings of the 12 surveys. In other words, 7.6% of visitors both hiked the trails and came through the gate on the same day.
- Trails were counted while open March-Sept of this year.
- Banco, Redondo, and Sulphur gate mostly do not have visitors Jan, Feb, and March due to snow.
- Non-Reportables: Employees account for estimated 50 vehicles per day on Preserve (50 multiplied by 2.0) through gates = 100 removed per day. Multiplied by days gates accessed per year, equates to 24,400 non-reportables removed from total count.

Table 1 shows the final estimates of visitors on a per month basis.

Valles Caldera National Preserve FY 2012 Estimated Visitation

Site	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	AADV†	Days with data	Adjusted Totals††
VCNP Main Gate	9,116	4,797	2,175	2,871	2,157	*2,782**	*8,695**	6,923	8,193	9,493	*12,917**	*20,914**	217.814	295	*79,502*
Redondo Gate	466	289	3,553	0	0	0	*2,175**	1,076	4,756	*716**	*632**	*651**	55.600	210	*16,958*
Banco Gate	1,600	902	*1,116**	0	0	*39**	235	1,302	4,000	1,738	3,291	*3,535**	62.431	246	*19,041*
Sulphur Gate	268	176	1,544	0	0	0	306	369	361	254	841	*1,150**	17.327	251	*5,285*
Coyote Call Trail	0	0	0	0	0	*204**	399	644	443	512	*201*	441	14.346	185	*5,236*
Valle Grande Trail	0	0	0	0	0	*217**	86	276	282	1,665	1,990	331	25.103	185	*9,162*
															135,185
															110,785**

†AADV=Annual Average Daily Visitors, the total whole day counts for the given year, divided by the number of whole days with the data in that year

*** Some monthly totals are estimated when there is only partial data for the month. The values shown are calculated based on the daily average for the available data multiplied by the number of days in that month.**

††Adjusted Totals, where data is incomplete, are calculated by multiplying the AADV by the number of days in that year.

****VCNP Totals are adjusted to exclude "non-reportables" (employees, service vehicles, etc), for FY2012 "non-reportables" = 24,400**

Appendix A

Persons Per Vehicle Survey

Instructions and Form

INSTRUCTIONS FOR ENTERING DATA ON THE PERSONS-PER-VEHICLE SURVEY FORM

Valles Caldera National Preserve

1. This form is to be used to determine the number of persons per vehicle entering the Preserve. The VCNP staff will randomize the time schedule for each survey day. If a survey time period is marked AM please conduct a one hour survey between the hours of 8:00 AM and 12:00 PM. If the survey time period is marked PM please conduct a one hour survey between the hours of 12:00 PM and 5:00 PM. The surveyor conducts the survey for only one (1) hour during the sample period. The surveyor selects the time period when he/she can conduct the sampling on the survey day and at the survey location. Please vary your starting times during each sample periods and they do not need to start on the hour but need to be conducted for a one hour period.

2. The surveyor fills out the bottom of the form by entering their name, the date the survey is conducted, the time period of the survey, and always conducted **at the main VCNP gate.**

3. To fill out the body of the form, the surveyor counts the number of people in the vehicles as they enter the gate. A tally mark is then placed in the appropriate box representing the number of persons in that vehicle. (If there are 2 persons in a vehicle, put a tally mark in column two (2). If there are more than 6 passengers in a vehicle, put the exact number in column 7+.

4. Ask the driver the two questions on the form. Be friendly and explain the reason for the survey.

If you have any questions, please contact me at the above address or phone 5505.428.7717. Thank you for your cooperation

Based on NPS Form 10-157a **Valles Caldera National Preserve**

PERSONS-PER-VEHICLE (Autos)

Survey Form

BLOCK 1	*NUMBER OF PERSONS-PER-VEHICLE*							
	1	2	3	4	5	6	7+	
RECREATION VEHICLES								
TOTAL VEHICLES								**A.**
PERSON MULTIPLIER	x 1	x 2	x 3	X 4	x 5	x 6	SUM OF ENTRIES	
TOTAL PEOPLE								**B.**
							AVG. PPV ($^{B.}/_{A.}$) =	**C.**

Put ONE Tick Mark for each Vehicle in the appropriate column above which corresponds to the number of people within the vehicle. For example, if there are 5 people in a car, one tick mark would be noted in column five. This survey should be carried out the entire survey time period. At the end of the day, please tally the subtotals at the bottom and complete the appropriate math.

If you have any questions, please call Tim Haarmann, 505.428.7717

Survey Questions:

1. Today, have you stopped, or do you plan to stop, at one of the Pull-outs on Highway 4? Y or N

Yes	No
Total:	Total

2. Today, have you hiked, or do you plan to hike, on the Coyote Call or Valle Grande Trail? Y or N

Yes	No
Total:	Total

SAMPLE DATE: / /

SURVEY LOCATION SURVEYOR_____